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*Published in:*
Social Science and Medicine



*Publication date:*
1995

Pergamon

0277-9536(94)00253-3

*Soc. Sci. Med.* Vol. 40, No. 9, pp. 1221–1229, 1995

0277-9536/95 $9.50+0.00

# THE MEASUREMENT OF SOCIAL SUPPORT IN THE 'EUROPEAN RESEARCH ON INCAPACITATING DISEASES AND SOCIAL SUPPORT': THE DEVELOPMENT OF THE SOCIAL SUPPORT QUESTIONNAIRE FOR TRANSACTIONS (SSQT)

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**Abstract**—Social support is supposed to have a beneficial effect on the health and wellbeing of people. It is a central concept in the 'EUropean Research on Incapacitating DIseaes and Social Support' (EURIDISS). In general, two main distinctions concerning social support are made in the literature, providing four basic dimensions or types of social support: a *social-emotional* vs an *instrumental* type of social support, and a '*crisis*' or '*problem-oriented*' vs '*everyday*' or '*daily*' type of social support. Based on these types of social support, a series of items were formulated to measure actual supportive interactions or exchanges of resources. The items were spread over five scales. The social-emotional type of social support comprised three scales: daily emotional support; problem-oriented emotional support; and social companionship, while the instrumental type of social support consisted of two scales: the daily instrumental support and the problem-oriented instrumental support. Together, these items and scales constitute the so-called 'Social Support Questionnaire for Transactions' (SSQT).The main *objective* of this paper is to investigate whether one and the same instrument, i.e. the SSQT, allows for meaningful comparisons between patients with rheumatoid arthritis from different countries. More specifically, the dimensionality and invariance of the dimensions across countries of the SSQT are explored. To this end, patients from four different European countries (France, Norway, The Netherlands and Sweden) were asked to fill in the SSQT.The analysis of the data using principal component analysis (PCA) and simultaneous component analysis (SCA), did yield the intended scales, although the internal consistency of one of them, the daily instrumental support scale, is questionable. It is concluded that, particularly in the area of social-emotional support, the SSQT is a useful instrument for international comparative research.

*Key words*—rheumatoid arthritis, social support, SSQT

## INTRODUCTION

Social support is supposed to have a beneficial effect on the health and wellbeing of people. It is defined by Thoits [1] as: "(..) the degree to which a person's basic needs are gratified through interaction with others. Basic social needs include affection, esteem or approval, belonging, identity, and security. These needs may be met by either the provision of socio-emotional aid (..) or the provision of instrumental aid (..)".

Usually, two types of effects or functions of social support are distinguished: a *health-facilitating function*, by gratifying human needs for affiliation, affection, approval, identity maintenance, etc. and a *stress-reducing function*, by giving practical help, advice or information, etc. in certain situations. The latter effect is also known as the 'buffer effect' of social support: 'buffering' or ameliorating the impact of problematic events [1–4].

As indicated in the name of the research project: the 'EUropean Research on Incapacitating DIseases and Social Support' (EURIDISS), social support is a central concept in this study. The objective is to investigate the functions of social support for the course of the disease rheumatoid arthritis (RA) and, subsequently, for the daily functioning and quality of life of the patients involved [5].

Social support can be conceptualized and operationalized in several ways. In EURIDISS it is conceptualized as an actual transaction or exchange of resources between at least one recipient and one provider of these resources, intended to enhance the wellbeing of the recipients. Of course, according to the

'helper principle' ('by helping others you help yourself as well') the provider of social support may also benefit from supportive interactions although that is not the primary intention [6]. It is the intention of the helper which is at issue. Furthermore, whether the consequences or actual effects of the support provided are positive, neutral, or negative depends on the context in which a certain type of support is given and the viewpoint ('appraisal') of the persons involved [4, 7–9]. Several authors have emphasized that the viewpoint of the persons involved, in this case the RA patients (as well as those of significant others) should be seriously taken into consideration, since their point of view will influence the course of the disease and, more generally, their quality of life [10–13]. Therefore, in EURIDISS, the point of view of the patient with rheumatoid arthritis (the recipient), has been taken as the starting point. In the next section, the concept of social support as it is used in our study will be elaborated.

## THE DEVELOPMENT OF THE 'SOCIAL SUPPORT QUESTIONNAIRE FOR TRANSACTIONS' (SSQT)

In general two main distinctions concerning social support are made, yielding four main types of social support (Fig. 1): a *social-emotional type* (e.g. affection, sympathy or companionship) vs an *instrumental type* (e.g. advice, practical help or financial aid) of social support [1] and a *'crisis'* or *'problem-oriented' type* vs an *'everyday'* or *'daily' type* of social support [4, 14, 15].

Based on this typology a series of items were formulated to measure actual supportive interactions along these four basic dimensions. The choice of the items was primarily based on the 'Social Support List for Transactions and Discrepancies', which resulted from the reliability and validity study on socia' support and social network by Van Sonderen [4]. In addition, items or item contents from several other studies [16–20] were used and compared to those of Van Sonderen's questionnaire.

This resulted in a list of 28 items measuring actual supportive interactions or exchanges of resources within these four basic types of social support. These four types were supposed to consist of 5 scales. Built on Lin's distinction between a 'social' component and a 'support' component [21], the social-emotional support dimension was divided into a 'social relational' and an 'emotional' part and comprises three scales: 'Social Companionship' (SC; 5 items), 'Daily Emotional Support' (DES; 6 items) and 'Problem-oriented Emotional Support' (PES; 6 items), while the instrumental social support dimension consists of two scales: the 'Daily Instrumental Support' (DIS; 5 items) and the 'Problem-oriented Instrumental Support' (PIS; 6 items). Together, these items and scales constitute the so-called 'Social Support Questionnaire for Transactions' (SSQT) [5, 22]. It should be noted that although the SSQT is used in samples with RA patients, the SSQT as such is 'not disease-specific', that is, it can be applied to all sorts of samples.

Next, the SSQT was tested in two pilot studies: one in the Province of Groningen (The Netherlands) [23] and one in the Lorraine region (France). Partly based on language and cultural differences, the results of these two pilots suggested a reconsideration of the SSQT. Specifically, the original PIS items appeared to lean too heavily on the occurrence of certain problematic situations resulting in skewed frequency distributions. Therefore, the wording of some items was adjusted somewhat, while the items intended to measure 'problem-oriented instrumental support' (PIS), were reformulated in terms of 'expectations' instead of actual transactions, which was originally the case. This yielded the current version of the SSQT: it consists of 23 items (see items in Appendix). The three social-emotional scales (DES, PES and SC) as well as the 'daily instrumental support' (DIS) still measure actual supportive interactions. However, the 'problem-oriented instrumental support' (PIS) now measures expectations about the instrumental support to be received in certain problematic situations *if these should occur*. Of course, if they did occur, then this would certainly affect the responses in terms of 'actual supportive interactions'. This SSQT instrument is now being used by all the EURIDISS participants: Belgium (Leuven), France (Nancy), Italy (Florence, Bari), Norway (Oslo), The Netherlands (Groningen), Sweden (Göteborg) and the U.K. (Belfast, London); other countries still intend to join.

The main *objective* of this paper is to investigate whether one and the same instrument, i.e. the SSQT, allows for meaningful comparisons between patients with RA from different countries. Patients from four different European countries (France, The Netherlands, Norway and Sweden, which were the first

| | **Instrumental** | **Social-emotional** |
|---|---|---|
| **Daily** | **daily instrumental support** | **daily social-emotional support** |
| **Problem-oriented** | **problem-oriented instrumental support** | **problem-oriented social-emotional support** |

Fig. 1. Four basic types of social support.

participants in the EURIDISS project), were asked to fill in the SSQT in order to answer the following *research questions*: What is the dimensionality of the construct 'social support' as measured by the SSQT? Are the components that underlie the data invariant across the countries?

## METHODS

### *Sampling procedures*

The EURIDISS project is a multicentre, multidisciplinary longitudinal European research project, set up to explore the relationships between 'disease variables', 'social support' and a number of 'quality of life measures' among patients with rheumatoid arthritis (RA). The criteria for inclusion of patients were as follows: residents in the sampling areas, aged 20–70, diagnosis of RA according to the 1987 ARA criteria [24], and a disease duration of 4 years or less. Criteria for exclusion were: other serious incapacitating diseases, stage IV according to Steinbrocker's functional classes [25], or possible inability to follow up (e.g. subject foreseeable moving outside the sampling area).

According to these criteria, 744 patients with rheumatoid arthritis were included: 116 French patients, 292 Dutch patients, 238 Norwegian patients and 98 Swedish patients. The non-response rate varied from 12% (The Netherlands) to 30% (France). From data on the age and sex distribution of the Dutch, French and Norwegian non-responders, it appeared that the largest age differences occurred between the Dutch responders and non-responders with, on average, the latter being eight years older. The largest sex differences were found between the Norwegian responders and non-responders: of the former group 74% were female vs 83% of the latter. However, on average, the sex and age distributions of the European responders and non-responders were very similar: on average the non-responders were about one year older, while within the group of non-responders only 4% more female patients were found than within the group of responders.

Because of 'missing data' one Dutch and four Norwegian respondents were omitted, so that of the 744 RA patients 739 remained for further analysis. Patients with a disease duration ranging from a maximum of four years up to recent onset (mean = 2.5 years, SD = 2.3) were selected for the present study. The mean age of the respondents was 52.4 years (SD = 12.3), 30% were males and 70% were females; 75% were married and 83% lived with at least one other person.

A letter of informed consent, signed by the patients, was obtained from all the subjects participating in the study.

### *Statistical analyses*

For each country, the data were analysed first, by calculating correlations between the 23 items, and second, by a 'principal component analysis' (PCA) and a 'simultaneous component analysis' (SCA).

A way to see whether there are invariant components across the countries is by using PCA, followed by an orthogonal (or oblique) rotation, and then determining Tucker's congruence coefficient phi ($\phi$) [26]. If the congruence values are equal to or greater than 0.85, for the corresponding components across the countries, it can be concluded that the components are invariant but often $\phi$-coefficients $\geq 0.80$ are considered satisfactory [27, 28]. However, as the congruence value decreases, decisions with respect to the invariance of the components become increasingly difficult [29]. Another difficulty arises when the congruence value is low. In such a case, invariant components are not found, but they may nonetheless exist. These difficulties are circumvented by SCA [30]. In SCA the component weights are determined in such away that they are commonly defined for all countries. In this way SCA yields components which are invariant across countries by definition. Internal consistency figures were calculated by using Cronbach's alpha [31].

Because of translation difficulties,* item number 4 was missing for the French sample. Using the BMDP package [32], these missing item scores were estimated (predicted from the scores on the other items in that subscale). The total number of remaining missing values for all four samples was 14. For these values the item mean per country was substituted. The analyses were conducted with SPSS/PC+V4.0.1 [33] and the SCA programme for simultaneous components analysis [29].

## RESULTS

### *Results from the correlations between the items*

The correlations between the 23 items revealed that the signs of the correlations were almost all positive.† Also, the correlations of the items within each scale tended to correlate somewhat more highly with items of the same scale than with items belonging to a different scale. Next, the data were analysed by using PCA and SCA to answer the research questions mentioned above.

SCA does not explain the maximal amount of variance, as PCA does. Therefore, if the amount of

*Initially, the SSQT items were formulated in the Dutch language. Next, the items were translated from Dutch into English by a native English speaker who also mastered Dutch. Then, the items were re-translated from English into Dutch, this time by a native Dutch speaker who had also mastered English. Different outcomes were then discussed. The final SSQT was written in English and was sent to all EURIDISS participants. They translated and re-translated the English version, then, into their own language.

†A copy of the correlation matrices is available on request.

Table 1. The percentages of explained variance by SCA and PCA per country

| Number of components | SCA | PCA %NL | %FRA | %SWE | %NOR |
|---|---|---|---|---|---|
| 1 | 23.92 | 22.30 | 24.27 | 25.36 | 24.23 |
| 2 | 32.57 | 31.09 | 36.86 | 34.49 | 32.35 |
| 3 | 40.44 | 38.71 | 45.87 | 41.56 | 39.77 |
| 4 | 46.88 | 45.35 | 52.55 | 48.55 | 45.79 |
| 5 | 52.13 | 51.02 | 57.86 | 54.74 | 51.03 |

variance explained by separate PCA is considerably higher than the amount explained by SCA, the idea of common components becomes questionable for the data at hand. For this reason, the percentages of variance explained by SCA were compared to those explained by PCA per country (Table 1).

As can be seen from Table 1, the discrepancy between the variances explained by PCA and SCA was small. This means that the common components determined by SCA explained the data (almost) as well as the components of separate PCA. Hence, the same linear combination of variables (components) can be used in all subsamples to describe the data [29, 34].

The decision with respect to the number of components to be extracted is generally based upon three criteria:

(1) the existence of a so-called 'elbow' in the curve of the consecutive eigenvalues or corresponding explained amounts of variances;
(2) the eigenvalue-larger-than-one criterion; and
(3) considerations based upon the content of the variables, which are the items for the five scales in the current case [35].

From Table 1 it can be seen that there was no elbow in the percentages of explained variance. Furthermore, the percentage of variance to be explained by each variable was 4.35%. So, in all cases the fifth component explained more variance than that of one variable. According to the second criterion, a sixth component could be extracted as well. The third criterion pertains to the five scales, each of which was intended to measure a different aspect of the concept 'social support'. Accordingly, the five-dimensional SCA solution seemed of primary importance because it enabled us to see whether the explorative SCA results sustained the partition of the variables (items) into the scales (components) that were intended during their construction.

In order to interpret the components, the weights matrix was rotated according to the varimax criterion followed by an oblique procedure. This rotation method allows us to verify whether the five scales arise as five separately interpretable components. In Table 2, the rotated optimal weights, yielded by SCA common for the four countries, are reported.

As may be expected from the (almost exclusively positive) correlations between the items, almost all negative weights were close to zero (the strongest negative correlation being equal to −0.15). The interpretation of the simultaneous components can now be based upon the dominant positive weights per column of the weights matrix. Clearly, component 1 was dominated by the DES items, component 2 by the PES items, component 3 by the DIS items, component 4 by the SC items, and component 5 by the PIS items. It may, therefore, be concluded that the rotated SCA weights covered the intended scales (components) rather well. Unfortunately, item numbers 6 and 11 (PES) and item number 17 (DIS) seemed to fit less well into the intended factor structure.

The question then arises whether or not there was sufficient evidence to skip items 6, 11 and 17 from the SSQT. This question can be answered by considering 'simple weights'. This implies a further simplification of the weights by assigning 'simple weights' (0 or 1) to the variables (items), such that the resulting components exactly correspond to the intended scales. Clearly, the rotated SCA solution (Table 2) provided evidence to do so. The resulting *loadings* are the correlations between the variables (items) and the components; they thus provide useful information on which to base the decision whether or not to skip an item. In this respect, items' behaviour may be termed *incorrect* or *suspect*. An item is called *incorrect* if it does not belong to the prescribed (i.e. the intended) component but, according to its loading, to another

Table 2. The rotated weights matrix yielded by SCA common for the four countries

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| DES-items | | | | | |
| var.1 | 0.37 | 0.09 | −0.02 | 0.08 | −0.03 |
| var.2 | 0.36 | 0.12 | −0.04 | 0.07 | 0.04 |
| var.3 | 0.34 | 0.16 | 0.02 | −0.07 | −0.07 |
| var.4 | 0.45 | 0.01 | 0.03 | −0.05 | −0.03 |
| var.5 | 0.42 | 0.05 | 0.07 | −0.01 | −0.02 |
| PES-items | | | | | |
| var.6 | 0.34 | 0.08 | −0.02 | −0.01 | −0.03 |
| var.7 | 0.01 | 0.40 | 0.04 | 0.04 | −0.01 |
| var.8 | 0.09 | 0.41 | 0.00 | 0.05 | 0.00 |
| var.9 | 0.07 | 0.46 | 0.10 | 0.04 | −0.04 |
| var.10 | −0.15 | 0.56 | −0.00 | −0.02 | 0.02 |
| var.11 | 0.28 | −0.00 | −0.07 | −0.03 | 0.16 |
| SC-items | | | | | |
| var.12 | −0.01 | 0.06 | −0.00 | 0.2 | 0.10 |
| var.13 | 0.12 | −0.01 | −0.09 | 0.2 | 0.04 |
| var.14 | −0.06 | 0.01 | −0.03 | 0.4 | −0.01 |
| var.15 | 0.04 | 0.06 | 0.05 | 0.45 | 0.00 |
| var.16 | −0.05 | 0.01 | 0.04 | 0.52 | −0.07 |
| DIS-items | | | | | |
| var.17 | 0.01 | 0.3 | −0.09 | −0.04 | 0.37 |
| var.18 | 0.02 | 0.2 | 0.60 | −0.00 | −0.01 |
| var.19 | −0.04 | 0.0 | 0.64 | 0.02 | −0.01 |
| PIS-items | | | | | |
| var.20 | 0.03 | 0.15 | 0.4 | −0.03 | 0.12 |
| var.21 | −0.03 | −0.10 | 0.3 | 0.06 | 0.59 |
| var.22 | 0.01 | −0.15 | 0.4 | −0.02 | 0.40 |
| var.23 | 0.01 | 0.11 | −0.09 | −0.02 | 0.54 |

Table 3. The loadings of the scale components (item-scale correlations) by SCA of the 23 items from the SSQT for the samples from The Netherlands, France, Sweden and Norway, respectively

| | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *The Netherlands* | | | | | *France* | | | | |
| DES | var. 1 | 0.70 | 0.31 | 0.22 | 0.13 | 0.15 | 0.66 | 0.17 | 0.36 | 0.11 | 0.14 |
| | var. 2 | 0.65 | 0.22 | 0.27 | 0.03 | 0.21 | 0.81 | 0.25 | 0.53 | 0.14 | 0.27 |
| | var. 3 | 0.78 | 0.45 | 0.28 | 0.20 | 0.20 | 0.75 | 0.30 | 0.29 | 0.07 | 0.21 |
| | var. 4 | 0.76 | 0.45 | 0.20 | 0.21 | 0.24 | 0.93 | 0.26 | 0.47 | 0.09 | 0.23 |
| | var. 5 | 0.73 | 0.37 | 0.24 | 0.24 | 0.23 | 0.75 | 0.23 | 0.39 | −0.00 | 0.17 |
| PES | var. 6 | 0.37 | 0.74 | 0.23 | 0.12 | 0.06 | 0.60 | 0.39 | 0.33 | −0.08 | 0.20† |
| | var. 7 | 0.42 | 0.76 | 0.21 | 0.23 | 0.16 | 0.01 | 0.58 | 0.17 | 0.06 | 0.14 |
| | var. 8 | 0.36 | 0.78 | 0.18 | 0.19 | 0.12 | 0.09 | 0.79 | 0.17 | 0.25 | 0.16 |
| | var. 9 | 0.29 | 0.79 | 0.15 | 0.22 | 0.12 | 0.18 | 0.76 | 0.30 | 0.27 | 0.14 |
| | var. 10 | 0.19 | 0.61 | 0.12 | 0.15 | 0.06 | 0.01 | 0.74 | 0.17 | 0.28 | 0.25 |
| | var. 11 | 0.44 | 0.48 | 0.27 | 0.17 | 0.25* | 0.31 | 0.60 | 0.30 | 0.33 | 0.39 |
| SC | var. 12 | 0.22 | 0.5 | 0.63 | 0.10 | 0.10 | 0.41 | 0.34 | 0.71 | 0.16 | 0.35 |
| | var. 13 | 0.9 | 0.0 | 0.60 | 0.04 | 0.14 | 0.37 | 0.20 | 0.67 | −0.01 | 0.29 |
| | var. 14 | 0.3 | 0.3 | 0.65 | 0.16 | 0.10 | 0.32 | 0.26 | 0.69 | 0.08 | 0.17 |
| | var. 15 | 0.1 | 0.5 | 0.66 | 0.27 | 0.21 | 0.43 | 0.33 | 0.76 | 0.25 | 0.39 |
| | var. 16 | 0.1 | 0.5 | 0.61 | 0.20 | 0.08 | 0.32 | 0.20 | 0.74 | 0.18 | 0.17 |
| DIS | var. 17 | 0.23 | 0.29 | 0.12 | 0.47 | 0.19 | 0.20 | 0.24 | 0.15 | 0.54 | 0.17 |
| | var. 18 | −0.03 | 0.03 | 0.14 | 0.63 | 0.03 | 0.08 | 0.20 | 0.16 | 0.75 | 0.35 |
| | var. 19 | 0.01 | −0.01 | 0.13 | 0.60 | −0.02 | −0.05 | 0.07 | −0.03 | 0.64 | 0.40 |
| | var. 20 | 0.30 | 0.29 | 0.18 | 0.63 | 0.19 | 0.05 | 0.25 | 0.20 | 0.70 | 0.20 |
| PIS | var. 21 | 0.25 | 0.15 | 0.15 | 0.17 | 0.82 | 0.22 | 0.18 | 0.33 | 0.26 | 0.77 |
| | var. 22 | 0.15 | 0.08 | 0.10 | 0.16 | 0.73 | 0.15 | 0.08 | 0.25 | 0.39 | 0.73 |
| | var. 23 | 0.28 | 0.21 | 0.21 | 0.06 | 0.80 | 0.20 | 0.45 | 0.24 | 0.26 | 0.64 |
| | | *Sweden* | | | | | *Norway* | | | | |
| DES | var. 1 | 0.69 | 0.38 | 0.43 | 0.13 | 0.33 | 0.70 | 0.44 | 0.37 | 0.25 | 0.21 |
| | var. 2 | 0.72 | 0.34 | 0.29 | 0.18 | 0.36 | 0.66 | 0.35 | 0.38 | 0.26 | 0.16 |
| | var. 3 | 0.72 | 0.50 | 0.28 | 0.13 | 0.19 | 0.56 | 0.31 | 0.19 | 0.15 | 0.18 |
| | var. 4 | 0.78 | 0.49 | 0.30 | 0.26 | 0.32 | 0.74 | 0.45 | 0.34 | 0.14 | 0.19 |
| | var. 5 | 0.71 | 0.40 | 0.32 | 0.31 | 0.33 | 0.72 | 0.42 | 0.36 | 0.19 | 0.21 |
| PES | var. 6 | 0.60 | 0.59 | 0.22 | 0.21 | 0.30† | 0.39 | 0.64 | 0.33 | 0.22 | 0.21 |
| | var. 7 | 0.38 | 0.76 | 0.17 | 0.15 | 0.20 | 0.30 | 0.66 | 0.26 | 0.36 | 0.18 |
| | var. 8 | 0.46 | 0.78 | 0.43 | 0.12 | 0.33 | 0.48 | 0.70 | 0.36 | 0.29 | 0.25 |
| | var. 9 | 0.38 | 0.66 | 0.17 | 0.25 | 0.17 | 0.49 | 0.71 | 0.37 | 0.27 | 0.23 |
| | var. 10 | 0.11 | 0.59 | 0.02 | 0.04 | 0.22 | 0.09 | 0.46 | 0.14 | 0.15 | −0.02 |
| | var. 11 | 0.35 | 0.54 | 0.17 | 0.02 | 0.25 | 0.38 | 0.49 | 0.27 | 0.09 | 0.17 |
| SC | var. 12 | 0.32 | 0.29 | 0.59 | 0.34 | 0.27 | 0.28 | 0.26 | 0.59 | 0.21 | 0.24 |
| | var. 13 | 0.40 | 0.37 | 0.66 | 0.27 | 0.31 | 0.46 | 0.34 | 0.66 | 0.19 | 0.14 |
| | var. 14 | 0.24 | 0.09 | 0.73 | 0.14 | 0.19 | 0.29 | 0.31 | 0.72 | 0.20 | 0.22 |
| | var. 15 | 0.38 | 0.28 | 0.74 | 0.04 | 0.25 | 0.41 | 0.44 | 0.81 | 0.29 | 0.29 |
| | var. 16 | 0.16 | −0.01 | 0.66 | 0.03 | 0.25 | 0.23 | 0.28 | 0.68 | 0.21 | 0.15 |
| DIS | var. 17 | 0.25 | 0.13 | 0.19 | 0.56 | 0.28 | 0.18 | 0.34 | 0.14 | 0.55 | 0.31 |
| | var. 18 | 0.20 | 0.04 | 0.15 | 0.59 | 0.17 | 0.16 | 0.09 | 0.23 | 0.65 | 0.32 |
| | var. 19 | 0.02 | −0.04 | 0.16 | 0.59 | 0.11 | 0.13 | 0.19 | 0.17 | 0.63 | 0.28 |
| | var. 20 | 0.21 | 0.34 | 0.08 | 0.66 | 0.23 | 0.25 | 0.32 | 0.25 | 0.65 | 0.29 |
| PIS | var. 21 | 0.42 | 0.33 | 0.39 | 0.44 | 0.81 | 0.21 | 0.20 | 0.27 | 0.35 | 0.78 |
| | var. 22 | 0.20 | 0.14 | 0.14 | 0.06 | 0.70 | 0.13 | 0.14 | 0.18 | 0.42 | 0.74 |
| | var. 23 | 0.37 | 0.41 | 0.35 | 0.28 | 0.84 | 0.29 | 0.29 | 0.23 | 0.32 | 0.75 |

*Suspect. †Incorrect.

component (which is not the intended one). An item can be called *suspect*, if it not only loads on the prescribed component but also relatively highly on a component other then the intended one.

The forced SCA solution, with the intended scales as the components, appeared to explain 50.10% of the total variance. This is only 2.03% less than the variance accounted for by the optimal weights in SCA (which was 52.13%, see Table 1). This small loss of explained variance was consistent with the fact that the rotated weights matrix almost perfectly revealed these intended weights. Now that the components that corresponded to the intended scales had been defined, the loadings could be studied for any *incorrect* or *suspect* items and the correlations between the scales could be studied per country. Different scale correlations could be expected from the different patterns of correlations between the items. It should be noted, however, that the scale correlations affected the loadings in the sense that, if a scale (component) correlation was large, then the corresponding loadings would be large too. For this reason both the loadings (Table 3) and the scale correlations (Table 4) are reported.

At first glance, Table 3 shows that the intended components were dominated by the items that should dominate the components concerned. The analysis rather clearly yielded the intended factor structure for the separate countries.

From the rotated weights matrix presented before (Table 2), it appeared that item 11 (PES) and 17 (DIS) seemed to fit less well into the intended factor structure. Further inspection of Table 3 shows that item 11 was only suspect in the Dutch sample: it loaded 0.44 on component 1, which was about as large as 0.48, the loading on component 2. Item 17 clearly belonged

to the third component in all samples. Item 6 (PES), however, was incorrect both in the Swedish sample (0.60 and 0.59 on components 1 and 2) and in the French sample (0.60 and 0.39 on component 1 and 2). Hence, there seemed to be only very slight evidence for skipping item 11, while there was no evidence available for skipping item 17 from the SSQT. Concerning item 6, there seemed to be more reason to doubt. We will come back to this issue later.

The scale correlations themselves were interesting because they provide information per country about the resemblance of the concepts measured by the scales (Table 4).

The scales that measured emotional support (DES and PES) had rather large positive correlations for the Dutch (0.50), the Swedish (0.58) and the Norwegian (0.58) samples, but not for the French (0.31) sample. So the DES and PES scales seemed to measure closely related concepts in The Netherlands, Sweden and Norway, but not in France. Table 4 further indicates that the SC concept resembled the DES concept especially in France (0.52) and Norway (0.49) and less in Sweden (0.44) and The Netherlands (0.34). The concept of instrumental support measured by DIS and PIS were rather closely related in Norway (0.48) and France (0.43), somewhat less in Sweden (0.33), and very little in The Netherlands (0.17).

Finally, the internal consistency coefficients (Cronbach's alphas) presented in Table 5, show that, except for the daily instrumental support (DIS) scale, most scales were reasonably reliable (considering the number of items per scale).

Of the 25 alphas calculated, 48% were $\geq 0.70$ and 16% between 0.65 and 0.70. Deleting an item did not really increase alpha for any scale in a systematic way except, again, for the DIS scale. For The Netherlands, France and for the four countries together, alpha increased by 0.08, 0.09 and 0.07 respectively if item 17 was deleted ('Does it ever happen to you that people help you to do odd jobs?'). But Cronbach's alphas for the DIS scale still stayed rather low.

Table 4. The scale (components) correlations of the SSQT for the samples from The Netherlands, France, Sweden and Norway, respectively

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| *The Netherlands* | | | | |
| comp. 2 | 0.50 | | | |
| comp. 3 | 0.34 | 0.28 | | |
| comp. 4 | 0.22 | 0.26 | 0.24 | |
| comp. 5 | 0.29 | 0.19 | 0.20 | 0.17 |
| *France* | | | | |
| comp. 2 | 0.31 | | | |
| comp. 3 | 0.52 | 0.37 | | |
| comp. 4 | 0.10 | 0.29 | 0.18 | |
| comp. 5 | 0.26 | 0.33 | 0.38 | 0.43 |
| *Sweden* | | | | |
| comp. 2 | 0.58 | | | |
| comp. 3 | 0.44 | 0.30 | | |
| comp. 4 | 0.28 | 0.20 | 0.24 | |
| comp. 5 | 0.42 | 0.37 | 0.37 | 0.33 |
| *Norway* | | | | |
| comp. 2 | 0.58 | | | |
| comp. 3 | 0.49 | 0.47 | | |
| comp. 4 | 0.29 | 0.38 | 0.32 | |
| comp. 5 | 0.28 | 0.28 | 0.30 | 0.48 |

Table 5. Reliabilities (Cronbach's alphas) of the scales, per country and combined

| | Social-emotional support | | | Instrumental support | |
|---|---|---|---|---|---|
| Scales : | DES | PES | SC | DIS | PIS |
| Number of items: | (5) | (6) | (5) | (4) | (3) |
| Four countries combined | 0.76 | 0.73 | 0.68 | 0.38 | 0.64 |
| The Netherlands | 0.77 | 0.78 | 0.62 | 0.26 | 0.68 |
| France | 0.82 | 0.72 | 0.75 | 0.49 | 0.50 |
| Sweden | 0.77 | 0.73 | 0.70 | 0.37 | 0.69 |
| Norway | 0.70 | 0.66 | 0.73 | 0.44 | 0.62 |

## DISCUSSION

The results of our analyses showed that:

(1) the correlations between the items;
(2) the SCA results, as well as;
(3) the reliability figures point, all in all, in the same direction.

In general, for the scales 'Daily Emotional Support' (DES), 'Problem-oriented Emotional Support' (PES), 'Social Companionship' (SC) and 'Problem-oriented Instrumental Support' (PIS), the items per scale had relatively high inter-correlations, had a consistent pattern of loadings and constituted a satisfactorily reliable scale. Specifically, the correlations encountered for the items within the scales were higher than those for items across the scales. This holds for all four countries from which data were available.

The results from SCA sustained this finding. Both the components weights matrix and the component structure matrix revealed the intended pattern for these scales. Together with the finding that the amount of explained variance per country by SCA was hardly less than that by PCA, this indicates that the components that correspond with the scales (found exploratively as well as more confirmatively) are invariant across different European countries. This finding is consistent with the finding that these four scales were satisfactorily internally consistent for each country.

These results are encouraging for future research despite the low number of items per scale and the fact that a specific patient group was under study. This restriction of range (i.e. persons) may make internal consistency less likel[illegible] 36].

Although the overall pattern of findings concerning the items and the four social support scales, mentioned before, was consistent, this was less true for items 6 and 11 within the PES scale. For these items, the common weights exploratory encountered by SCA were not intended (Table 2). This urged us to take a closer look at the loadings of the components that corresponded with these scales. On inspection of Table 3, only one

incorrect item was found (item 6 in the French and Swedish sample) and one suspect item (item 11 in the Dutch sample). The corresponding PES scale was internally consistent for all four countries. For this reason, as well as considering the content of these two items, it seems indicated to retain these items for this scale.

Apart from the above, the results concerning the scale 'Daily Instrumental Support' (DIS) were less consistent. For each country, several inter-item correlations within this scale were found to be near zero. However, except for item 17, the weights from the SCA were encouraging, and the loadings for the components were not suspect at all (Tables 2 and 3 respectively). These values increased somewhat if item 17 was deleted, but it did not result in a satisfactorily internally consistent scale for each country. In addition, item 17 actually represents what the DIS scale was intended to measure (see Appendix). As the EURIDISS project continues, one might expect patients in the more serious stages of RA to become more inclined to seek and to receive daily instrumental support. Taking these considerations into account, it seems premature at this early stage of the research project to skip item 17 from the SSQT. With respect to the DIS scale, future results should give evidence of whether item 17 contributes sufficiently to the reliable and valid measurement of this type of support and, consequently, whether the conceptual considerations, underlying the SSQT, are tenable.*

In closing, many publications have appeared in the last few decades about social support. Most of them, however, lack a sound theoretical analysis on which the operationalization of social support can be based. This probably explains why results on social support are often so contradictory. Sometimes, only structural social network characteristics were used to measure social support, sometimes structural and functional aspects of social networks were mixed up, and most of the time only 'appraisals' (perceptions; satisfaction) of the social support provided were measured [4, 37]. A clear conceptual distinction between 'social support resources' (i.e. social network), 'supportive interactions' and 'appraisals' of social support is seldom made in research on social support [4, 19, 37–40]. The same is true for the distinction between the provision or the perception of social support, the persons who provided it or were expected to provide it, and the satisfaction with the amount or type of social support. Often, therefore, the results concerning the amount and/or type of social support (provided or perceived) are biased or contradictory as are their relationships with other variables, e.g. health status or wellbeing. The purpose of this paper was:

(1) to develop an instrument to measure social support that was based on a conceptual analysis of the construct 'social support'; and

(2) to assess whether one and the same instrument, the 'Social Support Questionnaire for Transactions' (SSQT), measuring supportive interactions between at least two persons, allowed for meaningful comparisons across countries.

The conceptually intended factor structure of the SSQT was supported by our statistical procedures. The five components or scales ('Social Companionship', 'Daily Emotional Support', 'Problem-oriented Emotional Support', 'Daily Instrumental Support' and 'Problem-oriented Instrumental Support') encountered, were rather invariant across countries, making the SSQT, as a 'not disease-specific' and general measure of social support, useful for international, comparative and longitudinal research both across diseases and across countries. The latter is an important characteristic of the SSQT as, generally speaking, standardization is mostly not directed towards cross-cultural differences. Furthermore, as a general measure of social supportive interactions, not mixed up with social network characteristics, it prevents "..the compounding of the direct effects of life events on social support and the interactive (buffering) effects of life events with social support" [37] which makes the SSQT an even more useful instrument in assessing social support.

*Acknowledgements*—The authors would like to thank the rheumatologists S. van der Burg (Martini Hospital, Groningen), H. Lim (Scheper Hospital, Emmen), M. van Rijswijk and M. van Leeuwen (Academic Hospital, Groningen), F. Speerstra (Wilhelmina Hospital, Assen; and Refaja Hospital, Stadskanaal) (all from The Netherlands); A. Gaucher and J. Pourel (Department of Rheumatology, Nancy, France); and T. Kvien and L. Smedstad (the Norwegian Lutheran Hospital, Oslo, Norway) for their collaboration. In particular, we want to thank all the patients; without their cooperation this study would not have been possible. We also would like to thank our two colleagues of the Northern Centre for Health Care Research (NCH) of the University of Groningen, The Netherlands, Peter van Linschoten (M. A.; psychologist) and Han deRuiter (M. A.; medical sociologist), with whom the collected items were mainly discussed. We are grateful for their contributions to the development of the SSQT. The EURIDISS study is supported nationally, in France by a contract INSERM CRE 891102 and a grant from the Société Française de Rhumatologie; in The Netherlands by 'Het Nationaal Reumafonds' The Netherlands, and the Ministry of Welfare, Health and Cultural Affairs; in Norway by the Norwegian Research Council for Medicine; and in Sweden by Riksförbundet mot Reumatism, Stockholm, and Göteborgs Läkaresällskap. Internationally, the study is supported by the COMAC-Health Services Research, contract MR4*0344-NL from the EC.

*We also carried out a PCA and an orthogonal rotation according to the varimax criterion. From this analysis it appeared that three items fitted less well in the intended factor structure; one of them was item 17 (DIS).

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## APPENDIX

### Social Support Questionnaire for Transactions: SSQT

*Items and Response Categories Response categories for each item:*

1. seldom or never
2. now and then
3. regularly
4. often

*A. Items measuring Daily Emotional Support (DES):*

1. Does it ever happen to you that people are warm and affectionate towards you?
2. Does it ever happen to you that people are friendly to you?

3. Does it ever happen to you that people sympathise with you?
4. Does it ever happen to you that people show their understanding for you?
5. Does it ever happen to you that people are willing to lend you a friendly ear?

*B. Items measuring Problem-oriented Emotional Support (PES):*

6. Does it ever happen to you that people make you feel at ease?
7. Does it ever happen to you that people give you a nudge in the right direction, as it were?
8. Does it ever happen to you that people perk you up or cheer you up?
9. Does it ever happen to you that people reassure you?
10. Does it ever happen to you that people tell you not to lose courage?
11. Does it ever happen to you that you can rely on other people?

*C. Items measuring Social Companionship (SC):*

12. Does it ever happen to you that people drop in for a (pleasant) visit?
13. Does it ever happen to you that people just call you up or just chat to you?
14. Does it ever happen to you that you do things like shopping, walking, going to the movies or sports, etc., together with other people?
15. Does it ever happen to you that people ask you to join in?
16. Does it ever happen to you that you go out for the day with other people just for the enjoyment of it?

*D. Items measuring Daily Instrumental Support (DIS):*

17. Does it ever happen to you that people help you to do odd jobs?
18. Does it ever happen to you that people lend you small things like, for example, sugar or a screwdriver or something like that?
19. Does it ever happen to you that people lend you small amounts of money?
20. Does it ever happen to you that people give you information or advice?

*E. Items measuring Problem-oriented Instrumental Support (PIS):*

21. If necessary, do people help you if you call upon them to do so unexpectedly?
22. If necessary, do people lend you valuable things?
23. If necessary, do people help you, for example, when you are sick, when you have transport problems or when you need them to accompany you somewhere?